Annotation to
"Classical Unified Field Theory and Associated Technologies" by Emil Rudyak
Discovery in physics.

I present the proofs of the previously unknown proportionality factor in the Poynting vector. The proof of the factor value permitted me to lay a foundation for the Classical Unified Field Theory. The presented theory proves electromagnetic nature of generation of the entire mass of elementary particles, spin, magneton, and all interactive forces. All proofs are based on the action of four Poynting vectors, so that two of these vectors are in the elementary particle nuclei, whereas two other vectors are beyond their nuclei radius. The intensity distribution law for bound pairs of electrical and magnetic fields in each of Poynting vectors in elementary particle nuclei depends on the nucleus radius in ½ power, while beyond the nucleus limits, it is quadric (equations 1.55). In doing this, it is proven that the entire mass is electromagnetic for all presented elementary particles.

In the present-day physics the proportionality factor in the Poynting vector is considered as unknown, and its value as not proven. I have proven that this factor is equal to (K-1) so that K = 119.8685. This *K* value is defined from the quadratic equation (1.185), which includes only fine structure constant (1.1.55; 1.189, p. 6).

In the presented paper the theoretical data obtained, using this K factor value, perfectly coincide with the known experimental data for electron, mu meson, proton, and neutron. In this process, the (1.55) equations permit to define mass density and energy in any point located both inside the nuclei of these elementary particles and beyond their bounds. They also permit to reveal the formation of all parameters in these elementary particles, including the neutron "fur coat" (p. 12 and Fig. 2).

K factor participates in the formation of all elementary particle parameters. Any artificial downward or upward bias of this K factor value (that I have proven) results in the contradiction to all experimental data and world constants. Therefore, I believe that (K-1) number of 118.8685 is the scientific discovery of the previously unknown proportionality factor in the Poynting vector.

It is probable that the second value of the (1.185, p. 25) quadratic equation root equal to: K_2 = 1.01683 participates in the formation of the "dark matter" elementary particles – 'black holes".

About myself:

I have the learned degree and academic rank of the USSR Higher Certification Commission. Diploma MTH No. 058512.

Diploma of the senior research fellow in the major: Electrophysics MCH No. 070418 of 1971.

I have more than 100 research papers and inventions.

Classical Unified Field Theory and associated Technologies.

Processes in kernels of elementary particles: formation of mass, spin, magneton and forces under the influence of four Poynting Vectors.

(Scientific discovery)

Emil Rudyak

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(Translation from Russian. Google: Э.Рудяк, Классическая единая теория поля…)

I have more then 100 published scientific works, patents, and as a scientific degree and an academic status of VAK USSR.

Contents

- The "end of light" is to receive a matter of "Black holes".
- I have date on structure and parameters of elementary particles "the Dark matter".
- The generator of relativistic transition from one time in another (III. page 4) will allow to change events in the past. Transition from the past is "Revival dead".
(Needs experimental validation).

Abbreviations

A	–	mass coefficient (equation 1.182, page 10)
A'	–	non-dimensional mass coefficient (equation, page 16)
a	–	width ratio of Neutron's cover (ratio between inner and outer radiuses)
B	–	magnetic field density
B_{1r}, $B_{1\tau}$, B_{2r}, $B_{2\tau}$	–	radial (*r*) and tangential (*τ*) components of B inside (*1*) and outside (*2*) the kernel
C	–	light velocity
D	–	spin coefficient (equation 1.183, page 11)
D'	–	non-dimensional spin coefficient (equation 3.5, 3.21)
dV	–	volume element in spherical polar coordinates
E	–	electric field intensity
E_0	–	value of E on kernel's border
E_{0p}, $E_{0\mu}$, E_{0c}, E_{0e}	–	values of E_0 for Proton (*p*), Mu-meson (*μ*), Neutron's cover (*c*) and Electron (*e*)
E_{1r}, $E_{1\tau}$, E_{2r}, $E_{2\tau}$	–	radial (*r*) and tangential (*τ*) components of E inside (*1*) and outside (*2*) the kernel
e	–	universal charge constant
F	–	Coulomb force
F_w	–	gravitational interaction force
F_μ	–	magnetic force of magneton in each kernel's semi sphere
g_o	–	field impulse density – Poynting Vector
ħ	–	Plank constant
K	–	basic coefficient of the theory (equation 1.185, page 6)
K – 1	–	coefficient for field impulse density
L	–	arm of magnetic moment of couple of forces in the kernel ($L = 2*N*r_0$) (equation 3.29, 3.30 page 19)
M	–	magnetic moment of magneton
m	–	mass
m_0, n_0	–	two point objects with m_0 and n_0 pairs of elementary particles with positive (+) and negative (-) charges *e* each pair correspondingly

$m_p, m_\mu, m_n, m_c, m_e$	–	mass of Proton (*p*), Mu-meson (*μ*), Neutron (*n)*, Neutron's cover (*c*) and Electron (*e*)
$m_{1Er}, m_{1E\tau}, m_{2Er}, m_{2E\tau}$	–	mass components due to radial (*r*) and tangential (*τ*) components of E inside (*1*) and outside (*2*) the kernel
m_k	–	mass of kernel
m_{kp}	–	mass of Proton kernel
m_{kp0}	–	common mass of Proton kernel
N	–	magneton coefficient (equal to the ratio $r_{c.\mu.}/r_0$)
P	–	spin impulse
P_o	–	total spin impulse inside the kernel
$P_{1Er}, P_{1E\tau}, P_{2Er}, P_{2E\tau}$	–	spin impulse components due to radial (*r*) and tangential (*t*) components of E inside (*1*) and outside (*2*) the kernel
R	–	distance between interacting objects
r	–	distance from kernel's center
r_0	–	radius of kernel (value of r on kernel's border)
$r_{0p}, r_{0\mu}, r_{0c}, r_{10c}, r_{0e}$	–	values of r_0 for Proton (*p*), Mu-meson (*μ*), Neutron's cover (outer – *0c*, inner – *10c*) and Electron (*e*)
$r_{c.s.}$	–	radius of a trajectory of total spin impulse P_0
$r_{c.\mu.}$	–	coordinate of application point of the composite force F_μ in each semi sphere from the kernel's center
$S_x, S_y, S_z,$	–	spin components relatively to axes x, y, z
S_{z1}	–	total spin value
$S_{1Er}, S_{1E\tau}, S_{2Er}, S_{2E\tau}$	–	spin components due to radial (*r*) and tangential (*τ*) components of E inside (*1*) and outside (*2*) the kernel
α^{-1}	–	fine structure constant
γ, γ_p	–	Proton's dual field constant. The double field at a proton was revealed of research of its nuclear magnetic resonance
μ	–	magneton
$\mu_p, \mu_\mu, \mu_n, \mu_c, \mu_e$	–	magneton of Proton (*p*), Mu-meson (*μ*), Neutron (*n*), Neutron's cover (*c*) and Electron (*e*)
μ_{p0}	–	common magneton of Proton's kernel
θ, *φ*	–	spatial angles in spherical polar coordinates

1. Introduction

The modern science suffers from a crucial deficiency in the sphere of the classical unified field theory, due to absence of knowledge on internal behavior inside elementary particle's kernel – nature, contents, spins, etc. There is no idea about all mass being electro- magnetic. Consequently, the absence of the classical unified field theory was hindrance for implementation of majority of essential, but problematic, technologies.

The Big Hadrons Collider was created to cognize the secret of birth of elementary Particle mass, but this secret, up to the time of this work, has not been discovered. Higgs boson is unable to discover this secret, since it needs itself to reveal the secret of formation of its own mass.

Consequently, the famous "Standard Model Theory" is collapsing. This theory cannot in general create any technology, especially those with life importance.

Due to the existing situation on Earth, collapse of the nations, remaining with outdated science and technology, can be quite probable.

The calculations presented by me not only provide answer to this question, but also reveal the essence of mass formation and density of its distribution in each infinitely small point, both inside and outside the elementary particle's kernel. This essence is proved and presented in the system of equations (1.55) below.

Classical unified field theory, created by me, permits, on its basis, to create several new technologies. The following examples can be mentioned:

i. Creation of plasma accelerators for creation of ecologically clean and unlimited energy of controlled deuterium thermonuclear synthesis. (Internet search: E. Rudyak patent).* I have created the equations of motion of deuterium plasma of controlled thermonuclear synthesis.

ii. Creation of devices for oriented excitation of electromagnetic field energy with almost unlimited range.

iii. Create an object of cognition of the possibility of relativistic transfer from one time to another. Power of 1500 kW and voltage of 5000 V will be need.

I have published three books in the sphere of this classical unified field theory.

These books are kept at the All-Union Institute of Scientific and Technical Information:

AUISTI, 403 Oktyabrskiy av., Lyubertsy, Moscow, www.viniti.ru.

References:

[1] E.M. Rudyak, № 57-85 Деп. 1985, 67 pages «Settled electromagnetic field, physical essence of occurrence of forces, moments of forces and the magnetic moment». (Electromagnetic nature and structure of mu-meson elementary particle are proved in this work).

[2] E.M. Rudyak, № 7287-B88, 1988. 38 pages «Settled electromagnetic field..., Part 2. Fundamentals of the unified interaction theory (Unified field theory).

[3] E.M. Rudyak, № 3584-B89, 1989. «New electromagnetic effect and its physical essence». (This effect was confirmed by Russian cosmonauts on a satellite, in a free fall, was recorded to video and was demonstrated on Russian television in December 1998. On video it was show the conductor connected to a source of current. In air balls from table tennis floated. At inclusion of an electric current in the conductor all balls within a second arrived and concerned the conductor with current. This effect confirms the theory created by me.)

*Patent: CA 2493140 G21B

2. Classical Unified Field Theory

The present theory represents distention of classical notations in field of electromagnetic structure of elementary particles and consequently can be considered as **Classical Unified Field Theory.**

In Ref. [1] and Ref. [2] the classical unified field theory, processes in the kernels of elementary particles and interactions are stated.

This theory is based on the proof of a spinning motion of electromagnetic fields and its electromagnetic masses in the kernels of elementary particles under the influence of four Poynting Vectors.

Distribution law of electric and magnetic fields over the kernels radius is proved.

Distribution mechanisms of formation of mass, spin, magneton, interaction forces are proved and formulas for its calculation are provided.

The electromagnetic nature of the whole Mass is proved as well.

It is proved that, interaction force and magnetic moment (magneton) are formed as incipient difference of values of electromagnetic mass centrifugal forces in opposite kernel's semi spheres while superimposed by external electric or magnetic field.

By now, I have proved electromagnetic structure of electron, mu-meson, proton and neutron; radiuses, parameters and features of their kernels are determined.

Theoretical data obtained by me perfectly coincide with well-known experimental parameters for these particles.

The classical unified field theory and its technologies will lead us to global changes in different areas of human activity, provided further researches.

3. Mathematical Formulation

The mathematical development and formulation of the Classical Unified Field Theory appear in Ref. [1] and [2]. This paper is continuation of these works and presents hereunder the final expressions and the consistency of final results with existing well-known experimental data for basic parameters (Mass, Magneton, Spin, Interacting Forces), as well as further development of derived parameters.

Numbering of formulas mentioned and/or presented hereunder refers to:

(1..X) - Ref. [1]
(2.X..X) - Ref. [2]
(3.X..X) - this paper

3.1. Electromagnetic fields of elementary particles

The expressions for radial (***r***) and tangential (***τ***) components of electrical (***E***) and magnetic (***B***) fields inside (***1***) and outside (***2***) elementary particle with radius r_0, as functions of the distance ***r*** from the particle's center, appear in Ref. [1], (1.55):

(1.55)

$$\left\{\begin{array}{l} |E_{2r}| = |E_{2\tau}| = |B_{2r}| = |B_{2\tau}| = \dfrac{E_o r_o^2}{r^2} \\[2ex] |E_{1r}| = |B_{1\tau}| = \dfrac{5}{2} * E_o * \dfrac{r^{1/2}}{r_o^{1/2}} * K \\[2ex] |E_{1\tau}| = |B_{1r}| = \dfrac{5}{2} * E_o * \dfrac{r^{1/2}}{r_o^{1/2}} \\[2ex] g_o = \dfrac{ExB}{4\pi c} * \dfrac{1}{(K-1)} \qquad \textbf{g}_o \textbf{– field impulse density} \\ \qquad\qquad\qquad\qquad\qquad \textbf{(Poynting Vector)} \end{array}\right.$$

K = 119. 8685; **(K= ln** $\frac{R_1}{r_0}$ **)**

Graphical presentation of the said components appears on Fig. 1.

The formula for fine structure constant:

$$\alpha^{-1} = \frac{\hbar c}{E_o^2 * r_o^4} = \frac{\pi(5/2)^2[K^2+1]}{10*\sqrt{3}*(K-1)}; \qquad (1.185)$$

α^{-1} **– fine structure constant**

α^{-1} 137,0391 K= 119,8685 (1.55), (1.189)

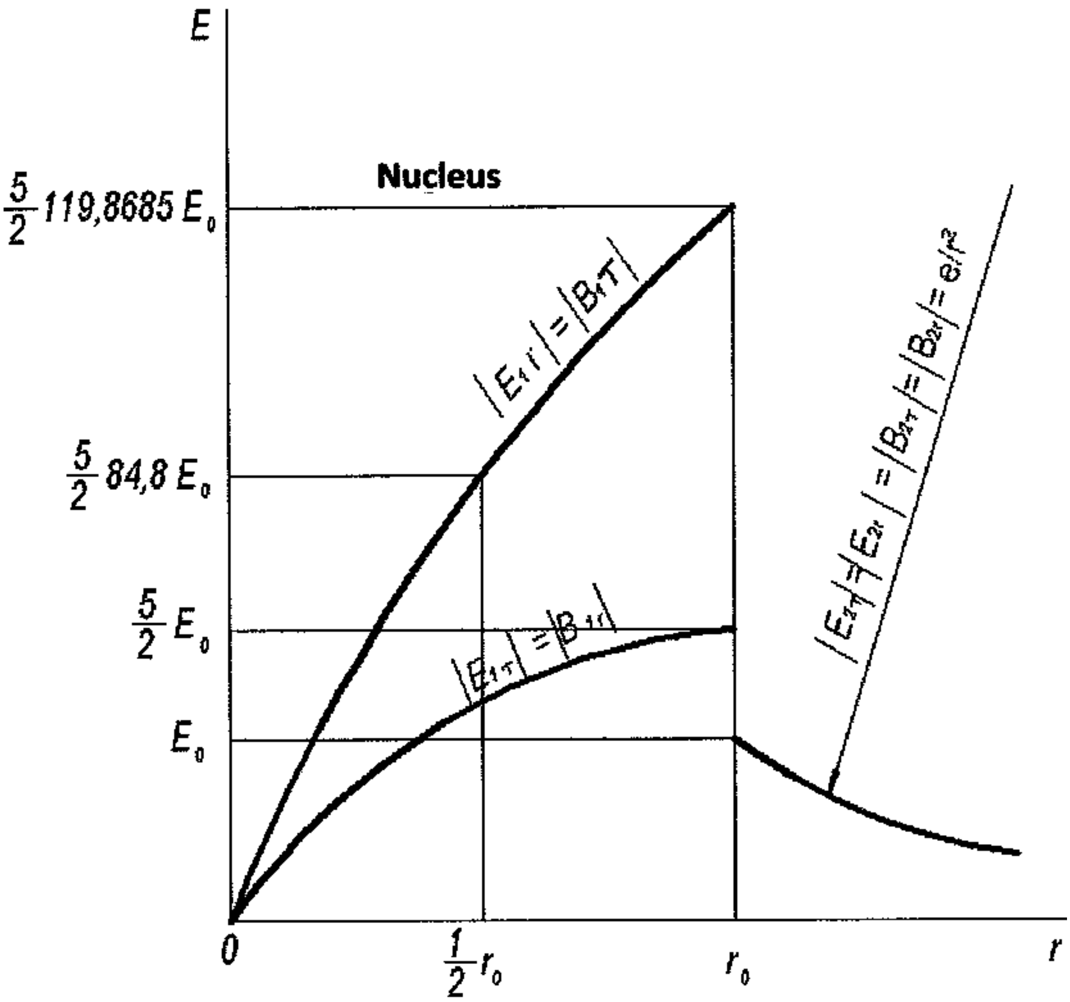
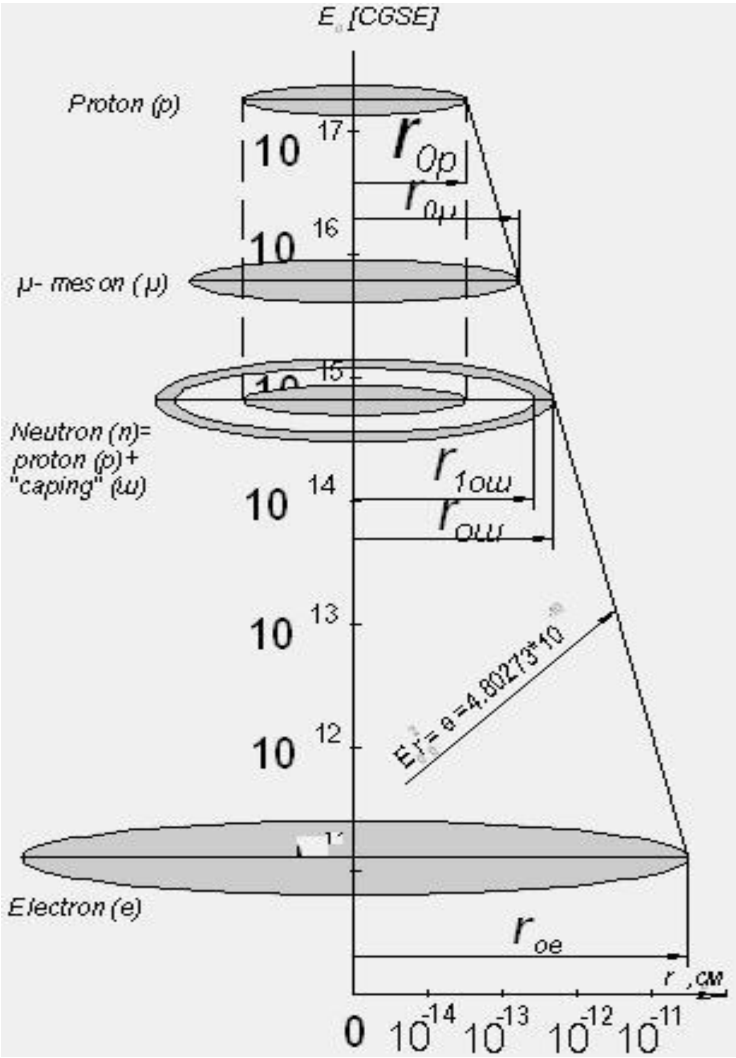


Fig. 1 Elementary Particle – Inner and outer Electrical and Magnetic Fields.

Change of sizes of field at a surface of kernels happens on a distance 10^{-8} r_0

3.2 Structure of elementary particles and their nucleus.



Proton

$\gamma_p = 1{,}670258682$

$\gamma_p E_{op}^2 r_{op}^3 = 4{,}76460588 \cdot 10^{-6}\ \gamma_p$

$\gamma_p E_{op} r_{op}^3 = 2{,}32507971 \cdot 10^{-23}\ \gamma_p$

$r_{op} = 4{,}84116155 \cdot 10^{-14}$

$E_{op} = 2{,}04922256 \cdot 10^{17}$

Mu-meson

$E_{o\mu}^2 r_{o\mu}^3 = 8{,}96033554 \cdot 10^{-7}$

$E_{o\mu} r_{o\mu}^3 = 1{,}2363466 \cdot 10^{-22}$

$E_{o\mu} = 0{,}724743 \cdot 10^{16}$

$r_{o\mu} = 2{,}574258 \cdot 10^{-13}$

Neutron

$E_{oш}^2 r_{oш}^3 = 3{,}146812083 \cdot 10^{-7}$

$E_{oш} r_{oш}^3 = 3{,}52041374 \cdot 10^{-22}$

$E_{oш} = 8{,}938756377 \cdot 10^{14}$

$r_{oш} = 0{,}733002634 \cdot 10^{-12}$

$r_{10ш} = 0{,}724384464 \cdot 10^{-12}$

$r_{10ш} = a^* r_{0ш}$

$a = 0{,}988242673$

$(1 - a^3) = 0{,}03485897$

Electron

$E_{oe}^2 r_{oe}^3 = 4{,}3341132 \cdot 10^{-9}$

$E_{oe} r_{oe}^3 = 2{,}556002114 \cdot 10^{-20}$

$E_{oe} = 1{,}695661039 \cdot 10^{11}$

$r_{oe} = 5{,}321996264 \cdot 10^{-11}$

Fig. 2

m- mass (1.182)	μ **- magneton (1.147)**
A=21,017886 * 10^{-20}[sec^2 /cent^2]	**N=0,363151898**
$m_e = A E_{oe}^2 r_{oe}^3$	$\mu_e = N E_{0\mu} r_{0\mu}^3$
$m_\mu = A E_{o\mu}^2 r_{o\mu}^3$	$\mu_\mu = N E_{0\mu} r_{0\mu}^3$
$m_p = A^* \gamma E_{op}^2 r_{op}^3$	$\mu_p = N\gamma E_{0p} r_{0p}^3$

$$\alpha^{-1} = \frac{\hbar c}{E_o^2 * r_o^4} = \frac{\pi(5/2)^2[K^2+1]}{10*\sqrt{3}*(K-1)};(185)$$; α^{-1} **- fine structure constant**

***F_w*=** $$\frac{4*m_o n_o}{3(k-1)} * \frac{E_o^2 r_o^4}{R^2}\left[Ln\left(\frac{1-\frac{2r_o}{R}}{1+\frac{2r_o}{R}}\right)+\frac{1}{1-\frac{2r_o}{R}}-\frac{1}{1+\frac{2r_o}{R}}\right];$$ (2,78) (see page 25)

3.3 Well-known experimental data for elementary particles

	Mass:	Magneton:
electron:	m_e **= 0,9109389748*10^-27^ gr.**	μ_e **= 0,92821702*10^-20^**
mu-meson:	m_μ **= 1,883274*10^-25^gr.**	μ_μ **= 4,489818*10^-23^**
proton:	m_p **= 1,67262306*10^-24^gr.**	μ_p **= 1,410289755*10^-23^**
neutron:	m_n **= 1,67492861*10^-24^gr.**	μ_n **= 0,964636898*10^-23^**
	Difference of mass of neutron and proton	**Difference of magnetons of proton and neutron**
	$m_n - m_p$ **=2,30555*10^-27^ gr.**	$\mu_p - \mu_n$ **= 0,445652854*10^-23^**

Light velocity C = 2, 99793*10^{10} cm/s, charge e = 4.80273*10^{-10} CGSE:
ħ – Plank constant = 1,054384*10^{-27} erg*sec.

Spin of elementary particles S (moment of quantity of spinning motion of electromagnetic mass relatively to particle center).

Spin relatively to axis X, Y, Z:
$S_x = S_y = S_z = \frac{1}{2}\hbar = 0.527192*10^{-27}$ erg.*sec.

Summary spin $S_{z1} = \sqrt{S_x^2+S_y^2+S_z^2} = \sqrt{3S_x^2} = S_x\sqrt{3}$; $S_{z1} = \frac{\sqrt{3}}{2}\hbar = 0,91312*10^{-27}$ erg*sec.

3.4 Theoretical formulas and their calculated:

Triple integral equations in spherical polar coordinates for the corresponding field functions (1.55) are comprised. They have given the following integral meanings for mass, as well as for magneton, spin and force, generated in nucleus of elementary parts.

3.4.1 Theoretical formula for mass. (1.182)

K=119,8685

$$m = \left\{\frac{\left(\frac{5}{2}\right)^2 \mathrm{K}}{4c^2\left(1-\frac{1}{K}\right)}\left[1+\frac{1}{(K)^2}+2\frac{4}{\left(\frac{5}{2}\right)^2 (K)^2}\right]\right\} E_0^2 r_0^3 = A\left(E_0^2 r_0^3\right)$$

$$A = \left\{\frac{\left(\frac{5}{2}\right)^2 119{,}8685}{4\left(2{,}99793*10^{-10}\right)^2\left(1-\frac{1}{119{,}8685}\right)}\left[1+\frac{1}{(119{,}8685)^2}+2\frac{4}{\left(\frac{5}{2}\right)^2 (119{,}8685)^2}\right]\right\} = 21{,}017886*10^{-20}\left[\frac{\sec^2}{cent^2}\right]$$

m **= 21, 017886*10^{-20}** $\left(E_0^2 r_0^3\right)$**; (values** $E_0^2 r_0^3$ **for each particle are shown in figure № 2).**

Calculated mass values:

γ_p **= 1, 670258682;** ***A*=21, 017886*10^{-20} [sec^2/cent^2]**

1. for electron:

$$m_e = A E_{oe}^2 r_{oe}^3 = 21{,}017886*10^{-20}*4{,}3341132*10^{-9} = 0{,}9109389715*10^{-27}\text{ gr.}$$

2. for mu-meson:

$$m_\mu = A E_{o\mu}^2 r_{o\mu}^3 = 21{,}017886*10^{-20}*8{,}96033554*10^{-7} = 1{,}8832731*10^{-25}\textbf{ gr.}$$

3. for proton:

$$m_p = A\left(E_{op}^2 r_{op}^3\right)\gamma = 21{,}017886*10^{-20}*4{,}76460588*10^{-6}\,\gamma_p = 1{,}6726231*10^{-24}\text{ gr.}$$

Perfect coincidence of theoretical mass values with their experimental values is noticed for all three elementary particles.

3.4.2. Theoretical formula for magnetons: (1.147, 150)

***N* = 0,363151898**

$$\mu = \left\{\frac{5}{14} * \frac{K+1}{K-1}\right\} * E_0 r_0^3 = \left\{\frac{5}{14} * \frac{120,8685}{118,8685}\right\} * 1 * E_0 r_0^3 = N\, E_0 r_0^3 = 0.363151898\left(E_0 r_0^3\right)$$

μ = 0, 363151898* $\left(E_0 r_0^3\right)$; (value $E_0 r_0^3$ for each particle are shown in fig. 1).

Calculated magnetons values:

1. for electron: μ_e = 0, 363151898*2, 556002114*10^{-20} = 0, 928217019*10^{-20}

2. for mu-meson: μ_μ = 0, 363151898*1, 2363466*10^{-22} = 4, 189816*10^{-23}

3. for proton: μ_p = 0, 363151898*2.32507971*10^{-23}*γ_p = 1.410289755*10^{-23}

Perfect coincidence of magnetons values with their experimental values are noticed for all three elementary particles.

3.4.3 Theoretical formula for spin: (183)

D = 39, 58694532*10^{-10} $\left[\frac{sec}{cent}\right]$

$$S_{z1} = \frac{\pi\left(\frac{5}{2}\right)^2 K}{20C\left(1-\frac{1}{K}\right)}\left[1+\frac{1}{(K)^2}\right]E_0^2 r_0^4$$

Calculated spin value:

$$S_{z1} = \frac{3,141592654\left(\frac{5}{2}\right)^2 119,8685}{20*2,99793*10^{10}\left(1-\frac{1}{119,8685}\right)}\left[1+\frac{1}{(119,8685)^2}\right]E_0^2 r_0^4 = 39,58694532*10^{-10}\, E_0^2 r_0^4$$

$E_0^2\ r_0^4 = e^2$, where *e* - universal constant (charge); e = 4, 80273*10^{-10} CGSE

$S_{я1}$ = 39, 58694532*10^{-10}(4,80273*10^{-10})^2 = 0,913121*10^{-27}; $S_{xyz} = \frac{0,913121*10^{-27}}{\sqrt{3}} = \frac{\hbar}{2}$

Received theoretical spin perfectly coincides with its experimental value for all elementary particles, as far as they have the same charge and is linked with the same function with light velocity.

Interaction force:

When influence of external unified field E to the particle, solving of integrals (86-101) leads to the result (1.102) of appearance of force in the nucleus equal to coulomb force $F = E\,E_0 r_0^2$

3.4.4. Neutron

Neutron represents proton, that is surrounded by spherical shell – "coat" from outside. "Coat" has outer radius $r_{ош}$. and inner radius $r_{10ш}$. Values « a », $r_{10ш}$, $r_{ош}$., (1 - a^3), and also parameters $E_{ош} r_{ош}^3$ и $E_{ош}^2 r_{ош}^3$ are shown n figure № 1.

Inner radius of the "coat" is linked with outer expression - $r_{10ш} = a\ r_{ош}$.. As far as in mass and magneton formulas radius r_o enters of degree three, that is why coefficient (1 - a^3) enters into shown above formulas of these values for "coat" as spheric shell, received as follows: $r_{ош}^3 - r_{1ош}^3 = r_{ош}^3 - a^3 r_{ош}^3 = r_{ош}^3 (1 - a^3)$. That is why mass of «coat» - $m_ш$ и $\mu_ш$ - magneton of «coat» are equal:

$$m_ш = A\,E_{ош}^2 r_{ош}^3 (1 - a^3) = 21{,}017886*10^{-20} * 3{,}146812083*10^{-7} * 0{,}03485897 = 2{,}30555*10^{-27}$$ gr.

$$\mu_ш = N\,E_{ош} r_{ош}^3 (1 - a^3) = 0{,}363151898 * 3{,}52041374*10^{-22} * 0{,}03485897 = 0{,}4456527*10^{-23}$$

Neutron consist negative electric charge of «coat»: $-E_{ош} r_{ош}^2 = -e$ and positive electric charge of proton: $E_{op} r_{op}^2 = +e$, making it electrically neutral for outside space. Neutron has a mass equal to summary of mass of proton m_p and mass of the «coat»: $m_n = m_p + m_ш$. Neutron has magneton μ_n, equal to difference of megnetons of proton μ_p and «coat» $\mu_ш$, i.e.

$\mu_n = \mu_p - \mu_ш$.

Data of theory and experiment coincide:

Force formula F (2.78) for strong, week, nuclear and gravitation interactions is received by solving of integral (2.77).

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3.4.5. Consistency of accepted theoretical data

The consistency of the accepted theoretical expressions and data for the radius $\boldsymbol{r_0}$ and the electric field intensity $\boldsymbol{E_0}$ can be proved by the Law of Charge Conservation:

For each particle, the values of r_0 and E_0 must satisfy: **(Fig. 2)**

$$E_0 r_0^2 = const = e = \mathbf{4.80273 \cdot 10^{-10}\ CGSE} \quad \textbf{– Universal Charge Constant}$$

1. for electron:

$$E_{0e}\, r_{0e}^{\,2} = 1.695661039 \cdot 10^{11} \cdot (5.321996264 \cdot 10^{-11})^2 = \underline{4.8027300 \cdot 10^{-10}}$$

2. for mu-meson:

$$E_{0\mu}\, r_{0\mu}^{\,2} = 0.724743 \cdot 10^{16} \cdot (2.574258 \cdot 10^{-13})^2 = \underline{4.8027300 \cdot 10^{-10}}$$

3. for proton:

$$E_{0e}\, r_{0e}^{\,2} = 2.04922256 \cdot 10^{17} \cdot (4.84116155 \cdot 10^{-14})^2 = \underline{4.8027300 \cdot 10^{-10}}$$

4. for neutron's "cover":

$$E_{0c}\, r_{0c}^{\,2} = 8.938756377 \cdot 10^{14} \cdot (0.733002634 \cdot 10^{-12})^2 = \underline{4.8027300 \cdot 10^{-10}}$$

3.5. Presentation of Unified Classical Field Theory. Processes in kernels of elementary particles.

3.5.1. Decomposition of Spin impulse, Mass, Spin, Magneton and Force expressions

The component form for Mass due to internal (1) and external (2) electrical and magnetic fields (radial r and tangential τ) is derived by solving the following expressions (1.57) and (1.64), using the expressions (1.55) (see Para. 3.1). All solutions are performed in spherical polar coordinates (1.56).

Spin impulse P:

$$P = \iiint_{r\theta\varphi} g_0 dv \quad (1.57), \qquad dv = r^2 dr \sin\theta * d\theta * d\varphi; \quad (1.56)$$

Mass m :

$$m = \frac{P}{c}; \quad (1.64)$$

Spin impulse

$$\begin{cases} P_{1Er} = \dfrac{\left(\dfrac{5}{2}\right)^2 K E_0^2 r_0^3}{4c\left(1-\dfrac{1}{K}\right)}; & (1.59) \\ P_{1E\tau} = \dfrac{\left(\dfrac{5}{2}\right)^2 E_0^2 r_0^3}{4c(K-1)}; & (1.60) \\ P_{2Er} = \dfrac{E_0^2 r_0^3}{c(K-1)}; & (1.61) \\ P_{2E\tau} = -P_{2Er}; & (1.62) \\ P_0 = P_{1Er} + P_{1E\tau} & \end{cases}$$

Mass

$$\begin{cases} m_{1Er} = \dfrac{1}{c} P_{1Er} = \dfrac{1}{4c^2} * \dfrac{\left(\dfrac{5}{2}\right)^2 K E_0^2 r_0^3}{\left(1-\dfrac{1}{K}\right)}; & (1.65) \\ m_{1E\tau} = \dfrac{1}{c} P_{1Er} = \dfrac{\left(\dfrac{5}{2}\right)^2 E_0^2 r_0^3}{4c^2(K-1)}; & (1.66) \\ m_{2Er} = \dfrac{1}{c^2} * \dfrac{E_0^2 r_0^3}{(K-1)}; & (1.71) \\ m_{2E\tau} = \dfrac{1}{c^2} * \dfrac{E_0^2 r_0^3}{(K-1)}; & (1.72) \end{cases}$$

Mass in kernel - $m_k = m_{1Er} + m_{1E\tau}$;

Total mass:

$$m = m_{1Er} + m_{1E\tau} + m_{2Er} + m_{2E\tau}$$

Introducing (1.65), (1.66), (1.71) and (1.72) into the last equation will lead to (1.182) (see Para. 3.2.1).

The component form for Spin will be accepted by solving the following equation and using (55):

$$S = \iiint_{r\theta\varphi} g_0 \ \mathrm{r} \sin\theta \, \mathrm{dv}$$

Spin

$$S_{1Er} = \frac{\pi\left(\frac{5}{2}\right)^2 K E_0^2 r_0^4}{20c\left(1-\frac{1}{K}\right)}; \quad (1.75) \qquad S_{2Er} = \frac{\pi E_0^2 r_0^4 \mathrm{K}}{4c(K-1)}; \quad (1.78)$$

$$S_{1E\tau} = \frac{\pi\left(\frac{5}{2}\right)^2 E_0^2 r_0^4}{20c(K-1)}; \quad (1.76) \qquad S_{2E\tau} = -S_{2r}; \quad (1.79)$$

$$S_{z1} = S_{1Er} + S_{1E\tau}; \quad (1.81)$$

Introducing (1.75) - (1.76) into 1.81) will lead to (1.83) (see Para. 3.2.5).

Interaction force

Interaction force F and magnetic moment M (magneton μ) are formed as appearing difference of values of centrifugal forces of spinning electromagnetic mass in the opposite semi spheres of kernels when overlapping of external electric field (E) or magnetic field (B) that are included into parameter g_0 for solving.

Force: $F = \frac{mV^2}{r}$; $F = \iiint_{r\theta\varphi} g_0 \frac{c^2}{c} * \frac{1}{r} * \frac{\sin\varphi}{\sin\theta} * dv$; (1.86)

Solving of integrals (1.86-1.101) leads to the result (102) of appearance in the kernel of elementary particle of force, equal to Coulomb force:

$F = E E_0 r_0^2 = Ee$; (1.102)

Magneton

Magnetic moment *M* or magneton μ (at B=1)

$$M = \iiint_{r\theta\varphi} g_0 \frac{c^2}{c} \frac{1}{r} \frac{\sin\varphi}{\sin\theta} r\cos\theta * dv; \quad (1.143)$$

Solving of integrals (1.146-1.150) leads to the result of appearance of magneton:

$$\mu = \frac{5}{14} B E_0 r_0^3 \frac{K+1}{K-1}; \quad \text{(at B=1)}; \quad (1.150)$$

3.5.2. Basic Constants A', D', $r_{c.s.}$ / r_0 =0.2π, N

Mass m:

In expression (1.182) (see page 8) for mass let us release value of coefficient A from value of square of light velocity (c^2), included into its ratio, and let us present it as follows:

$$A = A'/c^2;$$

where the non-dimensional coefficient A' is defined by:

$$A' = \left\{ \frac{\left(\frac{5}{2}\right)^2 K}{4\left(1-\frac{1}{K}\right)} \left[1+\frac{1}{(K)^2}+2\frac{4}{\left(\frac{5}{2}\right)^2 (K)^2} \right] \right\} = 188,900219$$

Then the expression for mass of elementary particles will be as follows:

$$m = A' E_0^2 r_0^3 \frac{1}{c^2} \qquad (3.1) \qquad\qquad A' = 188,900219 \qquad (3.2)$$

Expression for the whole mass of elementary particles (182) contains three summands in square brackets.

Sum of first two summands participates in formation of mass of the kernel m_k, and third summand - in formation of mass outside it (see (1.65) – (1.72)). At this, proportion of mass of the kernel to the whole mass of the particle is equal to:

$$\frac{m_k}{m} = 0.99991539 \qquad (3.3)$$

From (3.1) and (3.3) we have: $$m_k = 0,99991539 A' E_0^2 r_0^3 \frac{1}{c^2} \qquad (3.4)$$

Spin S_{z1}

In expression (182) for spin S_{z1} let us release value of dimension factor D from value of light velocity (c), included into its ration, and let us present it as follows:

$$D = D'\frac{1}{c}$$

where the non-dimensional coefficient D' is defined by:

$$D' = \frac{\pi\left(\frac{5}{2}\right)^2 K}{20\left(1-\frac{1}{K}\right)} \left[1+\frac{1}{(K)^2} \right] = 118,67889 \qquad (3.5)$$

Then the expression for spin of elementary particles will be as follows:

$$S_{z1} = D'\frac{1}{c}E_0^2 r_0^4 \quad (3.6) \qquad S_{z1} = D'\frac{e^2}{c} \quad (3.7)$$

The effective values of spin S_{z1} and of field impulse of spin P are formed only in kernels of elementary particles – see (1.59) - (1.62) and (1.75) - (1.81). Therefore the coordinate of radius $r_{c.s.}$ of location of center of gravity of electromagnetic mass, spinning in kernel under the influence of Poynting vectors, will be determined from the expressions (1.59), (1.60), (1.75), (76), and is equal to proportion of their spin to field impulse:

Coordinate $r_{c.s.}$

$$r_{c.s.} = \frac{S_{1Er}}{P_{1Er}} = \frac{S_{1E\tau}}{P_{1E\tau}} = \frac{\dfrac{\pi\left(\frac{5}{2}\right)^2 K E_0^2 r_0^4}{20c\left(1-\frac{1}{K}\right)}}{\dfrac{\left(\frac{5}{2}\right)^2 K E_0^2 r_0^3}{4c\left(1-\frac{1}{K}\right)}} = \frac{4\pi}{20} r_0 = 0{,}2\pi\, r_0$$

$$r_{c.s.} = 0{,}2\pi\, r_0 \quad (3.8) \qquad \frac{r_{c.s.}}{r_0} = 0{,}2\pi \quad (3.9)$$

Found value of coordinate $r_{c.s.}$ allows us to present the value of spin S_{z1} as classic composition: $S_{z1} = m_k c\, r_{c.s.}$ (3.10). Taking into consideration (3.8) we have:

$$S_{z1} = m_k c 0{,}2\pi r_0 \qquad (3.11)$$

Substituting value m_k from (3.4) we have:

$$S_{z1} = 0{,}99991539 A' E_0 r_0^3 \frac{1}{c^2} c\, r_{c.s.} \qquad (3.12)$$

Taking into consideration equation (3.3) we have:

$$S_{z1} = \frac{m_k}{m} A' E_0^2 r_0^3 \frac{1}{c} r_{c.s.} \qquad (3.13)$$

Substituting value $r_{c.s.}$ from (3.8) we have:

$$S_{z1} = \frac{m_k}{m} A' E_0^2 r_0^3 \frac{1}{c} 0{,}2\pi r_0 \qquad (3.14)$$

From (3.14) we have: $$S_{z1} = \frac{m_k}{m} A'0{,}2\pi \frac{E_0^2 r_0^4}{c} \qquad (3.15)$$

It is known that: $S_{z1} = \frac{\sqrt{3}}{2}\hbar \qquad S_x = S_y = S_z = \frac{1}{2}\hbar \qquad \frac{\hbar c}{E_0^2 r_0^4} = \frac{\hbar c}{e^2} = \alpha^{-1}$

Where $\alpha^{-1} = 137{,}0391$ (1.179). (α^{-1} - fine structure constant which is universal constant).

That is why expression (3.15) will be as follows:
$$\boxed{\frac{\sqrt{3}}{2}\hbar = \frac{m_k}{m} A'0{,}2\pi \frac{e^2}{c}} \qquad (3.16)$$

From (3.16) we have:
$$\boxed{A' = \frac{m}{m_k}\frac{1}{0{,}2\pi}\frac{c}{e^2}\frac{\sqrt{3}}{2}\hbar} \qquad (3.17).$$
As $\frac{\hbar c}{e^2} = \alpha^{-1}$, we have:

$$\boxed{A' = \frac{m}{m_k}\frac{1}{0{,}2\pi}\frac{\sqrt{3}}{2}\frac{\alpha^{-1}}{1}} \qquad (3.18).$$
As $\frac{\sqrt{3}}{2} = \frac{S_{z1}}{\hbar}$, we have:

$$\boxed{A' = \frac{m}{m_k}\frac{1}{0{,}2\pi}\frac{S_{z1}}{\hbar}\alpha^{-1}} \quad (3.18') \qquad \boxed{A' = \frac{(5/2)^2 * k}{4(1-1/k)_{я}}\left[1 + \frac{1}{k^2} + 2 * \frac{4}{(5/2)^2 * k^2}\right]} \quad (3.18'')$$

From (3.6) we have:
$$D' = \frac{S_{z1} c}{e^2} \qquad (3.19),$$
As $S_{z1} = \frac{\sqrt{3}}{2}\hbar$, we have:

$$\boxed{D' = \frac{\sqrt{3}}{2}\frac{\hbar c}{e^2}} \qquad (3.20),$$
As $\frac{\hbar c}{e^2} = \alpha^{-1}$ we have:

.

$$\boxed{D' = \frac{\sqrt{3}}{2}\alpha^{-1}} \qquad (3.21),$$
As $\frac{\sqrt{3}}{2} = \frac{S_{z1}}{\hbar}$, we have:

$$D' = \frac{S_{z1}}{\hbar}\alpha^{-1} \qquad (3.21')$$

$$D' = \frac{\pi(5/2)^2 * \kappa}{20(1-1/\kappa)}\left[1 + 1/\kappa^2\right] \qquad (3.21'')$$

As we showed above (see (3.17), (3.18), (3.20), (3.21)), the basic coefficient K of the presented model, due to its functional relationships with Mass and Spin (through coefficients A' and D'), actually is forming the main quantum constants ħ and α^{-1}.

3.5.3. Magneton as Moment of a pair of Magnetic Forces

Magnetic moment M, or magneton μ, of the particle (at B=1) is determined by formulas (1.149), (1.150) in Ref. [1]:

$$\boxed{\mu = \frac{5}{14} B E_0 r_0^3 \frac{K+1}{K-1}} \quad (1.150)$$

$$\mu = \frac{5}{14}\left(\frac{119{,}8685+1}{119{,}8685-1}\right) B E_0 r_0^3 = 0{,}363151898 B E_0 r_0^3 \qquad \boxed{\mu = (0{,}363151898\, r_0) E_0 r_0^2} \quad (3.22)$$

Let us denote: $\boxed{N = 0{,}363151898}$ (3.23), than: $\boxed{\mu = (N r_0) B E_0 r_0^2}$ (3.24)

As $E_0 r_0^2 = e$, we have: $\boxed{\mu = (N r_0) Be}$ (3.25)

Upon influence of external magnetic field «B» in each of two sides of semi spheres of the kernel, a couple of equal and oppositely directed forces F_μ appear, being equal to:

$$\boxed{F_\mu = B\frac{E_0 r_0^2}{2}} \quad (3.26) \qquad \boxed{F_\mu = B\frac{e}{2}} \quad (3.27)$$

Coordinate of application point of this composite force F_μ in each semi sphere is located at a distance $r_{c.\mu.}$ from the kernel center:

$\boxed{r_{c.\mu.} = N r_0}$ (3.28) From (3.25) и (3.28) we have: $\boxed{\mu = r_{c.\mu.} Be}$ (3.28[1])

Arm L of this couple of forces is doubled distance $r_{c.\mu.}$

$$\boxed{L = 2 r_{c.\mu}} \quad (3.29) \qquad \boxed{L = 2N r_0} \quad (3.30)$$

That is why magneton may be presented as follows: $\boxed{\mu = L F_\mu}$ (3.31) $\boxed{\mu = (2N r_0)\frac{Be}{2}}$ (3.32)

3.5.4. Radiuses of kernels of elementary particles – for electron and mu-meson:

From magneton formula (3.25)	From mass formula (3.1)	From spin formula (3.11), (1.172)	
$r_0 = \frac{\mu}{NBe}$	$r_0 = \frac{A' e^2}{mc^2}$	$r_0 = \frac{\frac{\sqrt{3}}{2}\hbar}{0{,}2\pi m_k c}$	(3.33)

(For Radius of proton – see Remark on page 23)

For definite elementary particle, these radiuses are equal among themselves. It follows that:

1. From condition of equality of radiuses r_0 from the magneton and the spin formulas (3.33) we have:

$$\boxed{\frac{\mu}{NBe} = \frac{\sqrt{3}}{2}\frac{\hbar}{0{,}2\pi m_k c}} \quad (3.34);$$

From (3.34) we have:

$$\boxed{\mu = \frac{\hbar e}{2 m_k c}\frac{\sqrt{3}N}{0{,}2\pi}} \quad (3.35)$$

3.5.5. Magneton and mass of proton

Formula (3.35) may be recorded as follows:

$$\boxed{\mu_p m_{kp} = \frac{\hbar e}{2c}\frac{\sqrt{3}N}{0{,}2\pi}} \quad (3.36)$$

As shown above, since proton has double field, which increases simultaneously its own mass and magneton γ times (γ = 1, 670258682), therefore formula (3.36) may be recorded as follows:

$$(\mu_p \gamma)(m_{kp}\gamma) = \frac{\hbar e}{2c}\frac{\sqrt{3}N}{0{,}2\pi}\gamma^2$$

(3.37), where $\mu_p \gamma$ is common magneton of proton i.e.

$\mu_{po} = \mu_p \gamma$ (3.38), and value $m_{kp0} = m_{kp}\gamma$ (3.39) is common mass for proton kernel.

By that, formula (3.36) will be as follows:

$$\boxed{\mu_{po} m_{kpo} = \frac{\hbar e}{2c}\frac{\sqrt{3}*N}{0{,}2\pi}\gamma^2} \quad (3.40)$$

From expression (3.40) we have: $$\boxed{\mu_{po}=\frac{\hbar e}{2m_{kpo}c}\left(\frac{\sqrt{3}N}{0{,}2\pi}\gamma^{2}\right)}\qquad (3.41)$$

Taking into consideration from (3.3) proportions of mass: $m_k = 0{,}99991539m$, let us record expression (3.41) as follows:

$$\boxed{\mu_{po}=\frac{\hbar e}{2m_{po}c}\left(\frac{1}{0{,}99991539}\frac{\sqrt{3}N}{0{,}2\pi}\gamma^{2}\right)}\qquad (3.42)$$

Expression $\frac{\hbar e}{2m_{po}c}$, included into formula (3.42), is known as Bohr magneton. Calculation of number that is in bracket of equation (3.42) gives us expression for measured magneton of proton:

$$\boxed{\mu_{po}=\frac{\hbar e}{2m_{po}c}2{,}7930152}\qquad (3.43)$$

<u>Expression (3.43) is known in quantum concept for magneton of proton, and formation of coefficient standing as multiplicand to Bohr magneton is explained by me in formula (3.42).</u>

From condition of equality of radiuses under formulas (3.33) of magneton and mass we have:

- for electron and mu-meson:

$$\boxed{\mu=\frac{A' Ne^{3}}{mc^{2}}}\qquad (3.44)$$

- for proton:

$$\boxed{\mu_{po}=\frac{A' Ne^{3}}{m_{po}c^{2}}\gamma^{2}}\qquad (3.45)$$

3.5.6. Electric field intensity E_0

I. From proportion $\frac{m}{\mu}$:

From (3.1) and (3.24) let us find proportion $\frac{m}{\mu}$; $\frac{m}{\mu}=\frac{A' E_0^2 r_0^3 \frac{1}{c^2}}{N E_0 r_0^3}$, it follows that:

$$\boxed{\frac{m}{\mu} = \frac{A'\, E_0 \frac{1}{c^2}}{N}}$$ (3.45)

From (3.45) we have:

$$\boxed{E_0 = \frac{mN}{\mu} \frac{c^2}{A'}} \qquad (3.46)$$

Substituting into (3.46) value A' from (3.17) we have:

$$E_0 = \frac{m_k N 0{,}2\pi e^2 c}{\mu \frac{\sqrt{3}}{2}\hbar} \qquad (3.48)$$

II. From formula (3.33) of magneton:

$$E_0 = \frac{e}{r_0^2} = \frac{e}{\left(\frac{\mu}{Ne}\right)^2} = \frac{e^3 N^2}{\mu^2}; \qquad E_0 = \frac{e^3 N^2}{\mu^2} \qquad (3.49)$$

III. From formula (3.33) of mass:

$$E_0 = \frac{e}{r_0^2} = \frac{e}{(A')^2 \left(\frac{e^2}{mc^2}\right)^2} = \frac{e}{\left(\frac{m}{m_k}\frac{1}{0{,}2\pi}\frac{c}{e^2}\frac{\sqrt{3}}{2}\hbar\right)^2 \left(\frac{e^2}{mc^2}\right)^2} = \frac{e}{\frac{m^2}{m_k^2}\frac{1}{m^2}\frac{1}{(0{,}2\pi)^2}\left(\frac{\sqrt{3}}{2}\hbar\right)^2 \left(\frac{c^2}{e^4}\frac{e^4}{c^4}\right)} =$$

$$= \frac{e}{\frac{1}{m_k^2}\frac{1}{(0{,}2\pi)^2}\left(\frac{\sqrt{3}}{2}\hbar\right)^2 \frac{1}{c^2}} = \frac{m_k^2 e c^2 (0{,}2\pi)^2}{\left(\frac{\sqrt{3}}{2}\hbar\right)^2}$$

$$\boxed{E_0 = \frac{m_k^2 e c^2 (0{,}2\pi)^2}{\left(\frac{\sqrt{3}}{2}\hbar\right)^2}} \qquad (3.50)$$

IV. From formula (3.33) of spin:

$$E_0 = \frac{e}{r_0^2} = \frac{e}{\left(\frac{\sqrt{3}}{2}\hbar / 0{,}2\pi m_k c\right)^2};$$

$$\boxed{E_0 = \frac{m_k^2 e c^2 (0{,}2\pi)^2}{\left(\frac{\sqrt{3}}{2}\hbar\right)^2}} \qquad (3.51)$$

For definite elementary particle formulas (3.48), (3.49), (3.50) and (3.51) give the same result.

Formulas (3.33) for detection of radiuses of kernels and formulas (3.48), (3.49), (3.50) and (3.51) for field E_0 are applicable for electron and mu-meson.

Remark:
As proton has double field, in accordance with (3.38) and (3.39) for proton, we shall substitute μ and m with μ/γ and m/γ correspondingly in the indicated formulas for detection of r_0 and E_0.

Detected only by this formulas r_0 and E_0 may form indicated particles, as for the particles of other mass and magnetons their criteria parameters for $E_0^2 r_0^3$ and $E_0 r_0^3$ will not provide stability $E_0 r_0^2 = const = e.$

Mass

$$m = A' \; E_0^2 r_0^3 \frac{1}{c^2} \qquad A' = 188{,}90000219$$

$$m_k = 0{,}99991539 m = 0{,}99991539 A' \; E_0^2 r_0^3 \frac{1}{c^2};$$

Spin

$$S_{z1} = D' \; \frac{1}{c} E_0^2 r_0^4 \qquad D' = 118{,}678891$$

$$r_{c.s} = 0{,}2\pi r_0$$

$$S_{z1} = m_k c 0{,}2\pi r_0; \qquad r_0 = \frac{S_{z1}}{0{,}2\pi m_k c} \qquad r_0 = \frac{\frac{\sqrt{3}}{2}\hbar}{0{,}2\pi m_k c};$$

$$S_{z1} = 0{,}99991539 * A' \; E_0^2 r_0^3 \frac{1}{c^2} c 0{,}2\pi r_0$$

$$S_{z1} = \frac{\sqrt{3}}{2}\hbar; \; S_{z1} = \left(0{,}99991539 A' \; 0{,}2\pi\right)\frac{1}{c} e^2 = \left(\frac{\sqrt{3}}{2} 137{,}0391\right)\frac{e^2}{c};$$

$$\hbar = 137{,}0391 \frac{e^2}{c};$$

α^{-1} = $\frac{\hbar c}{e^2} =$ **137,0391 – fine structure constant – universal constant**

Magneton

$$\mu = \frac{5}{14} B E_0 r_0^3 \frac{K+1}{K-1}; \quad (B=1)$$

$$\mu = (0{,}363151898\, r_0) * 1 * E_0 r_0^2; \quad N = 0{,}363151898$$

$$r_{c\mu} = 0{,}363151898 * r_0; \quad r_{c\mu} = N\, r_0; \quad L = 2\, r_{c\mu}$$

$$\mu = \frac{1}{2} B E_0 r_0^2 * 2 * 0{,}363151898\, r_0 = F_\mu L$$

$$\mu = \frac{1}{2} Be2\, r_{c\mu} = \frac{1}{2} F_\mu L$$

$$r_0 = \frac{\mu}{N*1*e}$$

3.5.7 Pattern of formation of magneton

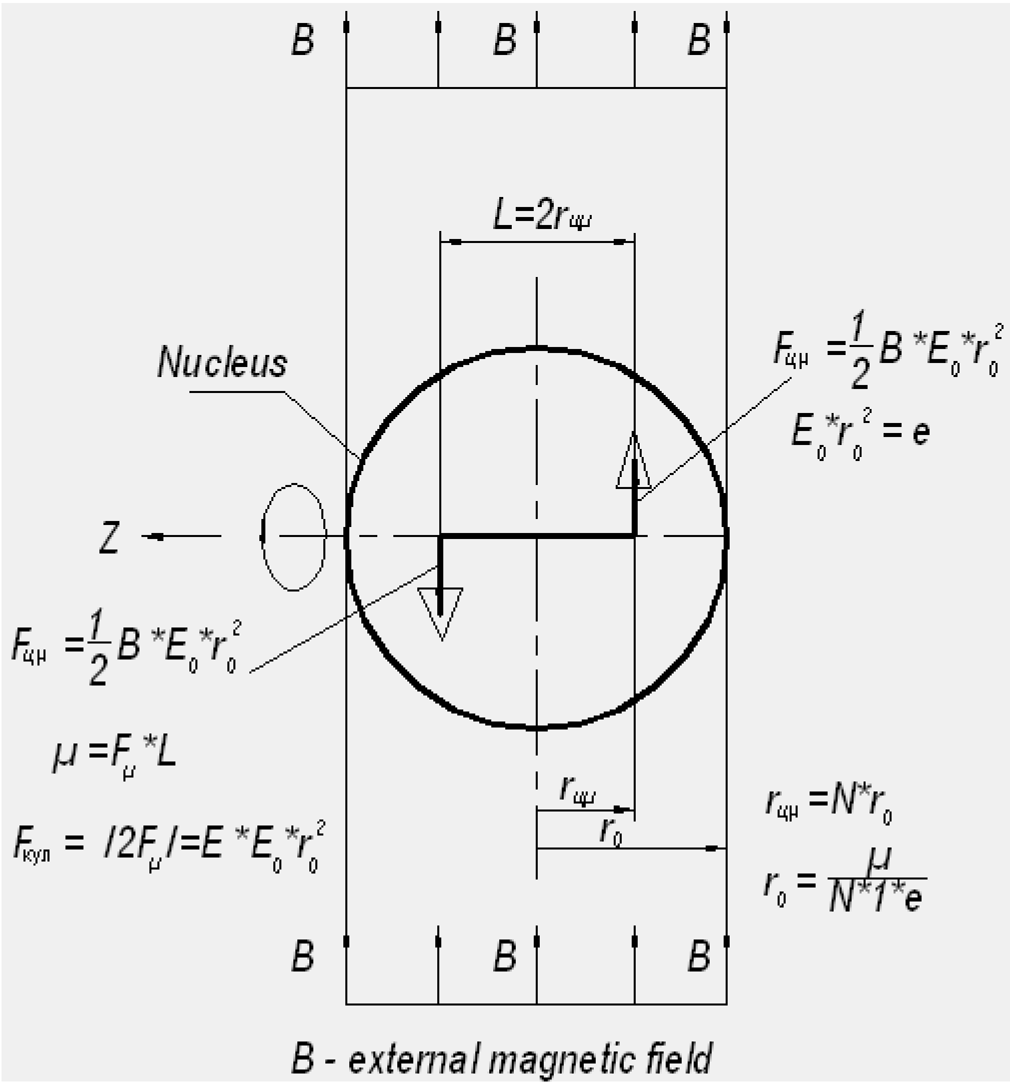

Fig. 3 Pattern of Magneton formation

Electromagnetic fields in the kernel of elementary particles are shown in Ref. [1], Fig.4.

3.5.8. Basic Coefficient of the Theory

The coefficient *K*, which was developed and defined in Ref. [1] as *K*= ln (R_1/r_0), (see (1.55), page 6)), represents the basic "brick" of the proposed theory, since it defines, through presented functional relations, all basic constants of the proposed, as well as existing, field theory models:

- the proportional coefficient (***K–1***) for field impulse density $\mathbf{g_o}$ (see (1.185), page 6) and gravitational force F_w (see (2.78), page 7). This is the coefficient for Poynting Vectors, which the scientists are seeking for the last century.
- the non-dimensional coefficient A' (see (3.1), (3.2), page 16) and dimensional coefficient $\boldsymbol{A} = \boldsymbol{A}' / \boldsymbol{C}^2$ (see (1.182), page 8) for mass of elementary particle.
- the non-dimensional coefficient $\boldsymbol{D}'$ (see (3.5), page 16) and dimensional coefficient $\boldsymbol{D} = \boldsymbol{D}' / \boldsymbol{C}^2$ (see (1.183), page 10) for spin of elementary particle.
- the main quantum constants $\boldsymbol{\alpha}^{-1}$ (see 1.185)
- the non-dimensional coefficient N for magneton of elementary particle (see (150), page 8), being equal to $\boldsymbol{N = r_{c.\mu.} / r_0}$
- the non-dimensional coefficient 0,2π (see (3.9), page 17)), being equal to 0,2π = $\mathbf{r_{c.s.}/r_0}$

3.5.9. Gravitational forces. "Black holes" in Space

The interacting force F_w (gravitational force) between two point objects, each consisting of m_0 and n_0 pairs of elementary particles with positive (+) and negative (-) charges e in each pair correspondingly, and with distance R between the points:

$$\boldsymbol{F_w} = \frac{4 * \mathrm{m_o} n_o}{3(K-1)} * \frac{\mathrm{E_o^2} r_o^4}{R^2} \left[Ln\left(\frac{1-\frac{2r_o}{R}}{1+\frac{2r_o}{R}} \right) + \frac{1}{1-\frac{2r_o}{R}} - \frac{1}{1+\frac{2r_o}{R}} \right]; \qquad \mathbf{(2.78)}$$

The quadratic equation $\alpha^{-1} = \frac{\hbar c}{\mathrm{E_o^2} * r_o^4} = \frac{\pi(5/2)^2[\mathrm{K}^2+1]}{10*\sqrt{3}*(K-1)}$; (1.185) gives two values of coefficient K:

1. K=119,8685; 2. K_2 =1,01683 (1.190)

The second value K_2 prompts opportunity existence of other matter, at which force of a gravitational attraction in 7062,9 time more (2.78)
(K-1)/(K_2-1) =118,8685/0,01683=7062,9.
It is possible that such structure of a matter creates know "Black holes" in Space.